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10/074,313

02/12/2002

Takeo Kanade

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06/15/2005

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EXAMINER

CZEKAJ, DAVID J

ART UNIT

PAPER NUMBER

2613

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/074,313 | Applicant(s) KANADE ET AL. | |
| | Examiner Dave Czekaj | Art Unit 2613 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>5/16/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-53 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 16, 19, 30, 35, 44, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conley (2001/0028399) in view of Klapman (6674461).

Regarding claims 1, 16, 30, and 44, Conley discloses an apparatus that relates to the production of new kinds of visual and aural effects for display in video (Conley: paragraph 0001). This apparatus comprises "positioning a plurality of camera systems relative to a scene such that the camera systems define a gross trajectory" (Conley: figure 1B, wherein the cameras define a trajectory with the diver), "displaying the transformed images in sequence" (Conley: paragraph 0016, lines 62-67, wherein the images are displayed). Although Conley fails to transform the images to superimpose a secondary induced motion, Conley does transform the images to superimpose a rotational effect (Conley: paragraph 0065, lines 52-60). The examiner notes that a rotational effect could be classified as induced motion. However, Conley fails to

disclose the image transformation is done independently of the three-dimensional structure of the scene as claimed. Klapman teaches that there exists a need for a method of video processing which is less dependent upon the judgment of a video producer (Klapman: column 1, lines 46-49). To help alleviate this problem Klapman discloses "the image transformation is done independently of the three-dimensional structure of the scene" (Klapman: column 3, line 63 – column 4, line 12, wherein the transformation is the synthesized image created from the interpolation). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to take the apparatus disclosed by Conley and add the transformation scheme taught by Klapman in order to obtain an apparatus that operates more efficiently by relying less on producer judgment.

Regarding claims 2-4, Conley discloses "positioning a plurality of pan/tilt and static camera systems relative to the scene" (Conley: figure 2, paragraph 0020, paragraph 0028).

Regarding claims 5, 19, 35, and 45, Conley discloses "applying a 2D transformation to the images" (Conley: paragraph 0029, wherein the transformation is the array attribute adjustments).

3. Claims 6-15, 17-18, 20-29, 31-34, 36-43, and 46-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conley (2001/0028399) in view of Klapman (6674461) in further view of Shashua (6094198).

Regarding claims 6, 20, 36, and 46, note the examiners rejection for claims 1, 16, 30, and 44, and in addition, claims 6, 20, 26, and 46, differ from

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claims 1, 16, 30, and 44 in that claims 6, 20, 36, and 46 further require applying a 2D image transformation according to a homography defined by a one point correspondence. Shashua teaches that prior art reconstruction methods lead to significant error in reconstruction and are quite sensitive to initial approximations (Shashua: column 2, lines 27-53). To help alleviate this problem, Shashua discloses a "2D image transformation according to a homography defined by a one point correspondence" (Shashua: column 3, lines 3-7). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to take the apparatus disclosed by Conley, add the transformation scheme taught by Klapman, and add the homographies taught by Shashua in order to obtain an apparatus that makes the display more appealing to viewers by providing a more efficient reconstruction method.

Regarding claims 7, 21, 37, and 47, Shashua discloses "the 2D image transformation includes mapping a point of interest in each image to the center of the image" (Shashua: figure 1, wherein the point of interest is the object, column 23, lines 1-5, wherein the center point is used in the reconstruction process).

Regarding claims 8, 10, 24, 26, 40, 42, 48, and 50, Shashua discloses "applying a 2D image transformation according to a homography defined by a two and three point correspondence between the images" (Shashua: column 4, lines 20-31, column 5, lines 44-67, wherein two and three point correspondences are used in the homographies).

Regarding claims 9, 11, 25, 27, 41, 43, 49, and 51, Shashua discloses “mapping a translation point in each image to the center of the image” (Shashua: figure 2, column 4, lines 28-31, wherein the translation points are p_0 and p_0'), “mapping a point of interest in each image to the translation point” (Shashua: figure 1, wherein the point of interest is the object), and “mapping a vertical unit point in each image to a point at a predetermined vertical relationship to the translation point” (Shashua: figure 2, column 4, lines 20-65, wherein the vertical unit point is the point P' , wherein the coordinates of point P' (x' , y' , 1) define a vertical relationship with the other points on the image).

Regarding claims 12, 28, 33, and 52, Conley discloses “generating an image corresponding to an image from a virtual camera system positioned along the trajectory between first and second camera systems” (Conley: figures 1B and 2, wherein a plurality of camera systems are shown) and “displaying the image between display of the transformed image from the first camera system and display of the transformed image from the second camera system” (Conley: paragraph 0016, lines 62-67, wherein the images are displayed).

Regarding claims 13, 29, and 53, Conley discloses “generating an image corresponding to an image from a virtual camera system having a rotation and translation interpolated from a rotation and translation of the first and second camera systems” (Conley: figures 1B and 2, wherein the camera systems and virtual cameras are shown, paragraph 0065, wherein the interpolated rotation and translation is the interpolation of images between camera locations).

Regarding claim 14, Conley discloses "positioning the plurality of camera systems relative to the scene includes positioning the systems in a close-ended configuration" (Conley: figure 1B, wherein the close ended configure is the "loop" or circle of cameras).

Regarding claim 15, Conley discloses "positioning the camera systems in an array configuration" (Conley: paragraph 0032, wherein the array configuration is the camera array).

Regarding claims 17 and 31, Conley discloses "the camera systems are simultaneously aimed at the target within the scene and a size of the target is substantially the same" (Conley: paragraph 0032, wherein the cameras are aimed at the target, wherein the target is the diver).

Regarding claims 18 and 32, Conley discloses "outputting the images in sequence corresponding to the position of the camera systems along the trajectory" (Conley: paragraph 0032, wherein the image sequence is displayed).

Regarding claims 22-23 and 38-39, Shashua discloses "the point of interest is/is not a point of the target" (Shashua: column 3, lines 46-49, wherein only some aspects of the object or point of interest are reconstructed).

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Czekaj whose telephone number is (571) 272-7327. The examiner can normally be reached on Monday - Friday 9 hours.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER